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Original Article

PRODUCTION POTENTIAL OF PERENNIAL GRASSES UNDER IRRIGATED CONDITION OF NORTHERN KARNATAKA

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ABSTRACT

An experiment was conducted at Main Agricultural Research Station, University of Agricultural Sciences, Raichur, Karnataka for two consecutive years of 2010-11 and 2011-12 to evaluate the performance of perennial grasses under irrigated condition. The treatments comprised six Hybrid Napier cultivar and two cultivars of Guinea grass. Perennial grass Hybrid Napier cv. The results of experiment revealed that DHN-6 recorded higher green fodder yield (710 q/ha) and which was on par with the hybrid napier cultivar DHN-6, APBN-1, IGFRI-7, Phule Jaywanth and CO-3. Lowest green fodder yield was recorded by NB-21 cultivar (411 q/ha). Among different perennial grasses, the highest net returns (Rs. 55863 ha^{-1}) and BC ratio (2.70) was obtained with Hybrid Napier cultivar DHN-6 and closely followed by APBN-1 (Rs. 53449 ha^{-1} & 2.63). The lowest was with NB-21 cultivar (Rs. 20440 ha^{-1} & 1.66).

KEYWORDS: Perennial Grasses, Hybrid Napier, Guinea Grass, Irrigated Condition, Green Forage Yield

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INTRODUCTION

High yielding nutritious green fodders are the basic input for affluent milk production in milch animals. India is the world's largest single milk producer, with a total of 132.4 million tonnes of liquid milk produced in 2012-13 (www.nddb.coop). Dairy production is also the most important agricultural activity in the country, contributing about 5.3 per cent to the agricultural gross domestic product. While in India the average yield per dairy cow per year is estimated to be 1,284 kg of liquid milk, the figure is 6,212 kg in the European Union and 9,117 kg in the United States (www.faostat.fao.org). This low productivity is attributed to inadequate supplies of quality feeds and fodder, gradual genetic deterioration and the general neglect of animals over the centuries leading to rise in the population of nondescript cows and buffaloes (Babu et. al. 2014). Due to ever-increasing population pressure of human beings, arable land is mainly used for food and cash crops, thus there is little chance of having good-quality arable land available for fodder production, unless milk production becomes remunerative to the farmer as compared to other crops. To meet the current level of livestock production and its annual growth in population, cultivation of perennial fodder varieties which can yield higher biomass per unit area is the immediate solution. With these objectives, the present study was conducted to explore the best compatible genotypes of perennial grasses under irrigated conditions.

MATERIALS AND METHODS

The field experiment was conducted during 2010-11 and 2011-12 at Main Agricultural Research Station,

Raichur, Karnataka, on medium black soil having 217 kg/ha available Nitrogen, 61 kg/ha available Phosphorus, 0.63 per cent organic carbon and 120 kg/ha available Potassium with 8.9 pH. Treatments comprised of six Hybried Napier cultivar, *viz.*, DHN-6, APBN-1, NB-21, IGFRI-7, CO-3 and Phule Jaywanth. Along with two cultivars of Guinea graa Viz., Nadani and Samrudhi. The experiment were laid out in randomized block design with eight treatment combination with three replications. Before the planting of grasses Farm Yard Manure were incorporated. The stem cuttings / root slips were planted in second fortnight of June with a spacing of 60x 60 cm spacing. After 15 days of planting the recommended dose of fertilizers were applied to all the grasses in the form of urea, DAP & Muriate of potash (MOP). The first irrigation was applied immediately after planting and there after irrigation were given at an interval of 13-15 days depending upon the climatic condition. The first cutting was taken about 65 days after transplanting (DAT) and subsequent cutting at an interval of 35-40 days (about 1 m. height). During first year (2010-11) 4 cuts and second year (2011-12) 6 cuts were taken. The growth and yield observations were recorded from the net plots and green fodder yield (GFY) of various grasses were converted on hectare basis in quintals. The protein content was analysed form the composite sample. The economics of each treatment was computed with prevailing prices of green grasses during corresponding years. The data of two years were statistically analyzed and discussed on pooled basis. The yield was further computed in terms of gross and net returns as well as BC ratio to asses the profitability.

RESULTS AND DISCUSSIONS

Almost similar trend was recorded in the yield during 2010-11 and 2011-12, it may be due to similar weather parameters & rainfall pattern. All the three seasons the error variance in the yield were found homogeneous and therefore, the pooling of data was done.

Growth Parameters

Pooled data of two year showed significant variation w.r.t plant height, number of tillers per plant and leaf: stem ratio.

Significantly higher plant height , was recorded with NB-21 (264 cm). However which was on par with the all the cultivars of hybrid Napier except Phule jaywanth. Significantly lower plant height was noticed in Guinea grass cv. Nandani (170 cm). Hybrid Napier cv. DHN-6 recorded significantly higher number of tillers (34). However which was on par with the hybrid Napier cultivar APBN-1 and Guinea grass cv. samrudhi. Lowest was with NB-21 cultivar (20) (Table 1). However guinea grass cv. Nandini recorded significantly higher leaf : stem ratio (3.20) closely followed by guinea grass cv. Samrudhi (3.08). The lowest leaf:stem ratio was observed in NB-21. The results are in conformity with the finds of Nilanthi *et. al* (2004).

Green Fodder Yield

Pooled data of two year showed significant variation in Green fodder yield (GFY) among different perennial grasses tried under irrigated ecosystem. Hybrid Napier cv. DHN-6 recorded significantly higher green fodder yield (710 q/ha) (Table 1). This is mainly because of highest plant height and number of tiller obtained in this cultivar and also may be due to quick growth , high yield potential , better palatability, digestibility and rooting ability as reported by Kakkar *et.al.*, (1986). The similar have been also reported by Sindhu et. al., (2001). However which was on par with the other cultivars viz.,, APBN-1, IGFRI-7, Phule Jaywanth and CO-3. Significantly lower green fodder yield was recorded by NB-21 cultivar (411 q/ha). This is mainly because of lower numbers of tillers and leaf : stem ratio.

Quality Parameters

Pooled data of two year showed that significant higher protein content was recorded in Guinea grass cv. Nandini (10.49 %) followed by Guinea grass cv. Samrudhi (10.47 %), Hybrid Napier cv. DHN-6 (9.95 %) , CO-3 (9.39) and APBN-1 (9.18 %). Lower protein content was recorded in NB-21 (6.05 %)(Table 1). Even though protein content was higher in both the varieties of Nandini grass , crude protein yield (CPY) was significantly higher in Hybrid Napier cv. DHN-6 (70.76 kg/ha). This is mainly because of higher GFY obtained in DHN-6. However which was on par with APBN-1 and CO-3. The results are in conformity with the finding of Tiwana *et. al.,* (2004).

Economics

The economic analysis indicated that, the highest net returns (Rs. 55863 ha^{-1}) and BC ratio (2.70) was obtained with Hybrid Napier cultivar DHN-6 and closely followed by APBN-1 (Rs. 53449 ha^{-1} & 2.63). The lowest was with NB-21 cultivar (Rs. 20440 ha^{-1} & 1.66) (Table 2). This is in confirmation of results represented by Premaratne and Premalal (2006) and Suneetha et.al., (2004).

It was concluded that based on the two years data, The Hybrid Napier genotypes DHN-6 and APBN-1 proved more suitable under irrigated condition of Northern Karnataka with highest green fodder yield, crude protein yield, net returns and BC ratio.

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APPENDIX

Table 1: Green Fodder Yield (GFY), Yield Attributes, Protein Content and Crude Protein Yield (CPY) Of Perennial Grasses under Irrigated Condition (Pooled Data)

Treatment Details	Plant Ht. (Cm)	No. of Tillers / Clump	Leaf Stem Ratio	Green Fodder Yield (Q/Ha)			CP %	CPY (Q/Ha)
				2010-11 (4 Cuts)	2011-12 (6 Cuts)	Pooled		
Hybrid Napier (NB-21)	264	20	0.94	354	468	411	6.05	24.80
Hybrid Napier (DHN-6)	223	34	2.93	633	787	710	9.95	70.76
Hybrid Napier (APBN-1)	226	27	2.64	616	765	690	9.18	62.91
Hybrid Napier (IGFRI 7)	249	24	2.56	606	739	672	8.45	56.79
Hybrid Napier (CO- 3)	232	25	2.51	593	707	650	9.39	60.71
Hybrid Napier (PhuleJaywanth)	214	23	2.27	611	728	670	8.14	53.98
Guinea grass (Samruddhi)	177	29	3.08	532	594	563	10.47	59.12
Guinea grass (Nandini)	170	24	3.20	500	557	529	10.49	55.16
SEm	14	2	0.03	57	50	37	0.59	3.57

Table 1: Contd.,								
CD (P=0.05)	41	7	0.09	NS	150	111	1.78	10.83

Table 2: Economics of Perennial Grasses under Irrigated Condition (Pooled Data)

Treatment Details	Green Fodder Yield (Q/Ha)	Gross Returns (Rs/Ha)	Net Returns (Rs/Ha)	B: C
Hybrid Napier (NB-21)	411	51409	20440	1.66
Hybrid Napier (DHN-6)	710	88705	55863	2.70
Hybrid Napier (APBN-1)	690	86291	53449	2.63
Hybrid Napier (IGFRI 7)	672	84023	51181	2.56
Hybrid Napier (CO- 3)	650	81250	48408	2.47
Hybrid Napier (Phule Jaywanth)	670	83697	50855	2.55
Guinea grass (Samruddhi)	563	70384	38092	2.18
Guinea grass (Nandini)	529	66094	34551	2.10
SEm	**37**	**4580**	**4580**	**0.14**
CD (P=0.05)	**111**	**13892**	**13892**	**0.43**